



INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

INFORMATION TECHNOLOGY

ASSIGNMENT

Course Name	:	ELECTRONIC DEVICES AND CIRCUITS
Course Code	:	A30404
Class	:	II B. Tech I Semester
Branch	:	Information Technology
Year	:	2015 – 2016
Course Faculty	:	Mr. M.Lakshmi Ravi Teja, Assistant Professor, Department of ECE

OBJECTIVES:

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

I. ASSIGNMENT - I

S. No	Questions	Blooms Taxonomy Level	Course Outcomes
UNIT – I			
1.	Write the differences between avalanche and zener breakdown mechanisms?	Knowledge	1
2.	Sketch the V-I characteristics of p-n junction diode for forward bias voltages. Distinguish between the incremental resistance and the apparent resistance of the diode?	Evaluation	2
3.	Distinguish between drift and diffusion current in a semiconductor. State continuity equation?	Analysing	1
4.	Define forbidden energy gap?	Remembering	1
5.	With appropriate circuit diagram explain the DC load line analysis of semi conductor diode?	Analysis	2

S. No	Questions	Blooms Taxonomy Level	Course Outcomes
6.	Explain the V-I characteristics of Zener diode and distinguish between Avalanche and Zener Break downs?	Understanding	1
7.	Define static resistance? Define dynamic resistance?	Remembering	1
8.	Define Fermi level?	Remembering	1
9.	Explain why a SCR is operated only in the forward biased condition?	Understanding	2
10.	List the applications of Varactor diode?	Analyzing	2
11.	What is the principle of operation of photodiode?	Knowledge	1
12.	Define DIAC? Define TRIAC?	Remembering	1
13.	Explain in detail, the variation of following semiconductor parameters with temperature, i) Energy gap ii) Conductivity.	Understanding	1
UNIT – II			
1.	Compare the rectifier and regulator?	Comprehension	3
2.	Draw the circuit of a half-wave-rectifier and find out the ripple factor, % regulation? Efficiency and PIV?		4
3.	Draw the circuit diagram of full wave rectifier? What are the merits of full wave rectifier?	Evaluation	4
4.	Draw the circuit of bridge rectifier and explain its operation with the help of input and output waveforms?		3
5.	Draw the block diagram of shunt and serial voltage regulator?	Knowledge	3
6.	Give the advantages and disadvantages of HWR and FWR?	Knowledge	3
7.	What is the need for voltage regulators? What are the drawbacks of unregulated power supply?	Knowledge	3
8.	Explain the necessity of a bleeder resistor in an L – section filter used with a Full Wave filter?	Understanding	4
9.	Explain about multiple L-section and multiple π -section filters?	Understanding	4
10.	Explain the operation of L-section filter and derive expression for ripple factor?(FWR)	Understanding	4

S. No	Questions	Blooms Taxonomy Level	Course Outcomes
11.	Explain about zener regulator?	Comprehension	3
12.	Compare the performance of Inductor filter and capacitor filter?	Understanding	3
UNIT – III			
1.	With a neat diagram explain the various current components in an NPN bipolar junction transistor & hence derive general equation for collector current, I_C ?	Understanding	5
2.	Define Early-effect; explain why it is called as base-width modulation? Discuss its consequences in transistors in detail?	Remembering	6
3.	Draw the input and output characteristics of a transistor in common emitter configurations?	Comprehension	5
4.	What is meant by operating point Q?	Comprehension	5
5.	Explain the operation of BJT and its types?	Understanding	5
6.	Explain the breakdown in transistor?	Understanding	5
7.	Explain about transistor amplifier?	Understanding	6
8.	Explain about the various regions in a transistor?	Understanding	5
9.	Define h_{ie} and h_{fe} in CE configuration?	Remembering	6
10.	Draw the hybrid model of a CB configuration?	Knowledge	6
11.	What is thermal runaway in transistors? Obtain the condition for thermal stability in transistors?	Remembering	5
12.	What are the differences between BJT and UJT?	Comprehension	5
13.	Draw the V-I characteristics of UJT?		6
UNIT – IV			
1.	Why biasing is necessary in BJT amplifiers?	Knowledge	7
2.	Draw and explain the ac load line?	Evaluation	7
3.	Compare the advantages and disadvantages of biasing schemes?	Knowledge	7
4.	Draw the collector-emitter feedback bias circuit and obtain the expression for the stability factor?	Comprehension	8
5.	Define 'Thermal Runaway' in transistors? Derive the condition to prevent 'Thermal Runaway' in Bipolar Junction Transistors?	Remembering	8
6.	Draw the circuit diagram of CC amplifier using hybrid	Application	8

S. No	Questions	Blooms Taxonomy Level	Course Outcomes
	parameters and derive expressions for A_i , A_v , R_i , R_o ?		
7.	Determine the significance of operating point, DC and AC load lines to ensure active region operation of a BJT in CE amplifier application?	Evaluating	8
8.	Differentiate bias stabilization and compensation techniques?	Evaluation	7
9.	Write down advantages of fixed bias circuitry?	Comprehension	7
UNIT – V			
1	List the important features of FET?	Knowledge	9
2	Define pinch off voltage?	Comprehension	9
3	Explain the operation of FET with its characteristics and explain the different regions in transfer characteristics?	Comprehension	10
4	Explain how a FET can be made to act as a switch?		10
5	Explain the construction & operation of a P-channel MOSFET in enhancement and depletion modes with the help of static drain characteristics and transfer characteristics?	Understanding	9
6	Discuss the high frequency response of CD Configuration?		10
7	Draw the small-signal model of common source FET amplifier. Derive expressions for voltage gain and output resistance?		10
8	Compare enhancement and depletion modes of a MOSFET with the help of its characteristics and construction?	Analyzing	10
9	Explain the significance of threshold voltage of a MOSFET. Discuss the methods to reduce threshold voltage, V_T ?	Understanding	10

Prepared By: K. Arun sai, Assistant Professor, Department of ECE

HOD, IT